GC1.W83
50-28

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

library

LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

WOODS HOLE OCEANOGRAPHIC INSTITUTION

WOODS HOLE, MASSACHUSETTS

WOODS HOLE OCEANOGRAPHIC INSTITUTION

Woods Hole, Massachusetts

Reference No. 50-28

OCEANIC BIOLOGY
(Oceanographic Research)

C. J. Fish, SUPERVISOR

April 1, 1950 - June 30, 1950

Periodic Status Report
Office of Naval Research
Contract N6-ori-195/TO 1/NR-083-003

July 1950

APPROVED FOR DISTRIBUTION

Director

ABSTRACT

During the period 1 April to 15 June physical and biological analyses were made on six species of marine fishes on which sound recordings had previously been taken. Field work was resumed in May to obtain information on spring and early summer spawning species. In all, recordings of eight species of fishes were made in May and June. Special attention was accorded the toad fish (Opsanus tau) which was found to produce one type of noise during the breeding season and another at other times. Weather station vessels have so far obtained 36 weekly sets of plankton collections and data, those at Station BAKER in June having been taken by the Canadian vessel HMCS ST. STEPHEN. Five Graduate Students transferred to the Narragansett Marine Laboratory on 13 June to continue in the training program in Biological Oceanography.

Subj: The Oceanic Biology Project.

RESEARCH

1. Sonic Fish program. Inasmuch as observations last year could not be instituted until the breeding seasons of most southern New England fishes had passed, special attention has been focused this year on noise production during the spring-early summer period. Intensive study has been made of the toadfish (Opsanus tau), previously shown to be a most important noisemaker. Its characteristic sound was first described during the war by a Naval Ordnance Laboratory investigator at Beaufort, N. C. as a low-pitched blast of about one-half second duration, similar to a foghorn. Although some 40 individuals were tested in the Narragansett Marine Laboratory in the late summer of 1949, this type of sound could not be induced. Instead, all produced a quite different sound, resembling a 'grunt.' Only once, on 27 July, was the 'foghorn blast' noted in an outside bay enclosure. This season, however, when earlier investigation was undertaken, the 'foghorn blast' was found prevalent and often continuous over the nesting areas in mid-June. To date, 20 recordings have been made in open water, where considerable numbers of specimens have been found producing sound simultaneously. It would appear that the 'foghorn blast' is closely correlated with the pre-spawning period, comparable perhaps to the mating calls of land animals, and ceases as soon as the eggs are deposited.

2. The toadfish is one of the few Atlantic species that constructs a nest guarded by the male parent. Throughout the incubation period the latter is quite silent, although the loud characteristic 'grunt' of annoyance produced at other seasons in the laboratory was recorded a few times when nesting specimens were agitated. In all, 40 disc recordings of the various toadfish noises have been obtained for further analysis.

3. Other species in breeding condition, for which recordings have been made during the past three months, are the kingfish (Menticirrhus saxatilis), silver hake (Merluccius bilinearis), scup (Stenotomus chrysops), sea bass (Centropristes striatus), weakfish (Cynoscion regalis),

and red-winged and common sea robins (Prionotus strigatus and P. carolinus). Observations in the laboratory and test enclosures are recorded with a Presto Recording Turntable and Esterline-Angus Graphic Ammeter. Field disc recordings are made with an Audograph assembly constructed for use as a portable unit. Marie P. Fish is in charge of this program assisted by Alton S. Kelsey, Jr., John A. Kelly, Jr. and Marilyn P. Fish.

4. During the period 1 April to 15 June, preliminary analyses of the sounds recorded during the summer of 1949 and spring of 1950 were completed at the Brown University Laboratory of Applied Physics by Mr. Kelsey, under the direction of Mrs. Fish. Sonic species involved were the red-winged and common sea robins, toadfish, puffer (Spheroides maculatus), burrfish (Chilomycterus schoepfii), and longhorn sculpin (Myoxocephalus octodecimspinosus). Using the Presto 16 inch disc recordings, the corresponding Esterline-Angus pressure records, and an Harmonic Wave Analyzer (Hewlett Packard) driving an Esterline-Angus, data was compiled for curves of sound pressure (dynes/cm^2/cycle) vs. frequency (cps). Plots were made for typical and extreme noise outputs for each species. A portion of this material was used by Mr. Kelsey for a Master's thesis at Brown University. It is now being revised for submission as a Technical Report of the Oceanic Biology Project.

5. Weathership Plankton program. Field work, which was instituted at Station EASY (35°00'N 48°00'W) on 15 February 1950 and at Station BAKER (56°30'N 51°00'W) on 25 February 1950, continues with excellent cooperation from the Commander, Eastern Coast Guard Area and his Weather Station vessel personnel. Arrangements for cooperation with the Canadian Meteorological Division had not been completed when HMCS ST. STEPHEN left to occupy Station BAKER for the period 8-29 April 1950 and April plankton records are therefore lacking for that station. Satisfactory arrangements were, however, completed before the ST. STEPHEN left on her second assignment in June and an excellent set of data has been received.

6. At Station EASY to date, a set of three weekly collections and records has been received from each of the following vessels:

Digitized by the Internet Archive
in 2025

https://archive.org/details/technical-report-woods-hole-oceanographic-institution_1950_50-28

USCGC	Coos Bay	Feb. 15	-	Mar. 8
USCGC	Mendota	Mar. 8	-	Mar. 29
USCGC	Barataria	Mar. 29	-	Apr. 19
USCGC	Rockaway	Apr. 19	-	May 10
USCGC	Dexter	May 10	-	May 31
USCGC	McCulloch	May 31	-	June 21
USCGC	Ingham	June 21	-	July 12

At Station BAKER similar weekly collections and records have been received from the following vessels:

USCGC	Castle Rock	Feb. 25	-	Mar. 18
USCGC	McCulloch	Mar. 18	-	Apr. 8
USCGC	Duane	Apr. 27	-	May 20
USCGC	Cook Inlet	May 20	-	June 10
HMCS	St. Stephen	June 10	-	July 1

7. The program is progressing well with a minimum of apparatus loss or damage. Twelve vessels have made a total of 38 weekly plankton stations, and so far but one half-meter net has been lost and two instruments slightly damaged. On the latter, repairs were easily effected.

TRAINING

8. At the end of the first college year on 3 June, two of the eight Graduate Student assistants in Biological Oceanography were dropped because of failure to maintain a minimum grade of 'C' in all subjects. A third withdrew voluntarily. The remaining five transferred to the Narragansett Marine Laboratory at Fort Kearney on 11 June where in addition to their research they will enroll in two special field courses being arranged for them.

BIBLIOGRAPHIC CARD INDEX

9. The bibliographic card index of titles on Pacific oceanography is being maintained up to date and expanded to include the Atlantic and Arctic. During the past quarter Mrs. Mary Curtis Cobb, working at Woods Hole, has indexed approximately 4,000 titles for the Atlantic and Arctic indexes, and 1,400 new Pacific title references.

PERSONNEL

No.	Name	Title	Total Man Days*
[illegible]	[illegible]	[illegible]	15
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]y-Technician	[illegible]
[illegible]	[illegible]	[illegible] assistant(s)	[illegible]
		Temporary assistants	[illegible]
			Total Man Days 144.1

*Man day consists of 8 working hours.

U.S.Navy

5 Office of Naval Research, Attn: Code N-428
2 Hydrographic Office, Attn: Librarian
1 Boston Branch Office, ONR
1 Naval Ordnance Laboratory
1 BuShips Code 847, NOL
1 Dr. R. H. Fleming, Hydrographic Office
1 Capt. Howard W. Fitch, Commandant, Mine Warfare School

U.S.Army

GHQ SCAP-NRS, Fisheries Division, Attn: W.C.Herrington

Civilian Government Institutions

Dr. J. L. Kask, Fisheries Division, Food & Agriculture Organization of the United Nations
Division of Territories & Island Possessions, Department of the Interior
Acquisitions Department, Library of Congress
U.S.Fish & Wildlife Service (Library)
U.S.Fish & Wildlife Service, Stanford University, California
U.S.Fish & Wildlife Service, Honolulu, T.H.
U.S.Geological Survey, Department of the Interior
U.S.National Museum

Universities and Scientific Agencies

Allan Hancock Foundation (Library), University of Southern California
American Museum of Natural History
Bingham Oceanographic Foundation, Yale University
Biological Laboratories, Harvard University
Brown University Department of Biology
California State Fisheries Laboratory, Terminal Island, California
California Academy of Sciences, San Francisco, California
Hopkins Marine Station of Stanford University, Pacific Grove, California
Institute of Fisheries Research, Morehead City, North Carolina, University of North Carolina
Museum of Comparative Zoology, Harvard University
National Research Council, Pacific Science Board, Washington, D.C.

National Research Council, Committee on Undersea Warfare,
Washington, D.C.
Oceanographic Laboratories, Seattle, Washington
The Scripps Institution of Oceanography, La Jolla, California
The University of Hawaii, Department of Zoology and Entomology
The University of Hawaii, Science Library
The University of Maryland, Department of Biology
The University of Miami Marine Laboratory, Miami, Florida
The University of North Carolina, Department of Biology
Washington State Department of Fisheries, Division of Biological
Research, University of Washington
Dr. G. L. Kesteven, FAO Regional Representative (Fisheries),
Commissioner General's Office, Singapore,
Federated Malay States.
Woods Hole Oceanographic Institution